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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,489	08/17/2000	ANISH K. ARORA	1018.050US1	6162

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LEYDIG VOIT & MAYER, LTD
TWO PRUDENTIAL PLAZA, SUITE 4900
180 NORTH STETSON AVENUE
CHICAGO, IL 60601-6780

EXAMINER

BARNES, CRYSTAL J

ART UNIT	PAPER NUMBER
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2121

DATE MAILED: 03/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/641,489

Applicant(s)

ARORA ET AL.

Examiner

Crystal J. Barnes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9,10,15-18,21 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 3,8,11-14,19,20 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 August 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Wilbert L. Starks, Jr.
Primary Examiner
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Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

- device "180" in figure 2 is not mentioned on page 12 line 7,
- IR device "190" in figure 2 is not mentioned on page 13 lines 9, and
- asynchronous address "506" in figure 5 is not mentioned on page 17 lines 12, 15, 16.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

- synchronous addresses "304" on page 17 lines 11-12 and asynchronous addresses "306" on page 17 lines 12, 15, 16 are not mentioned in figure 5.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, 6, 7, 9, 10, 15-18, 21, 23, and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,621,662 to Humphries et al. in view of USPN 6,185,611 to Waldo et al.

As per claim 1 wherein an architecture for an automation system, the automation system to control and monitor a plurality of devices, the architecture comprising at least one look-up service [lookup service 212] to maintain at least one

database of the plurality of devices [nodes, services, devices] by a plurality of device attributes [segments, attributes] including device type [type segment, service type] and physical location [board number, physical location], and of a plurality of device objects [software objects, objects] corresponding to the plurality of devices [nodes, services, devices] by mapping [one-to-one mapping] a name [subtype segment, common name] for each device object [software object, object] to at least one address [node ID segment, address] for each device object [software object, object]; a soft-state store [directory, Java space 222] to manage at least periodic refresh information [transmits messages at periodic intervals] for the plurality of devices [nodes, services, devices] and the plurality of device objects [software objects, objects], the refresh information [responses] managed by the soft-state store [directory, Java space 222] as a plurality of soft-state variables [records]; and a publication/subscription eventing component [request/acknowledge mechanism, event mechanism] to enable subscriptions [notifications] to events [events] related to changes in the plurality of soft-state variables [records] managed by the soft-state store [directory, Java space 222]; the Humphries et al. reference discloses the home automation system is free form configuration (see figure 3 and column 9 lines 15-16). The host computer 20

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transmits, at periodic intervals, a message to every node to determine whether or not that node is connected to the network (see column 9 lines 34-41). From the responses and based upon records the host computer 20 keeps in a directory as to which nodes should be connected to the network, the host computer 20 can detect if any node has been disconnected from the network (see column 9 lines 41-45).

When the host computer 20 does not receive a response from a node that should be connected to the network, the host computer 20 can activate an auto-dialer to make a service call to a monitoring service (column 9 lines 46-55). The domain segment indicates whether the node resides in the host computer 20 as a software object or resides on the network as a hardware object (see column 9 lines 62-66).

While the prior art home automation system did have some software objects that represented physical nodes, there was not a one-to-one mapping as in the invention (see column 10 lines 36-38). The node ID segment is used to identify each application node out on the system (see column 10 lines 42-45). The type segment logically groups similar nodes together and the node ID segment distinguishes different nodes having the same type segment (see column 10 lines 52-55). The subtype segment of the address identifies the hardware that is connected to the node (see column 10 lines 56-57). While the subtype segment would provide a

description of the type of device, the board number is used to identify the physical location of the particular device (see column 11 lines 2-6). Once a message has been transmitted from a source node to a destination node, the destination node sends an acknowledgement message back to the source (see column 12 lines 9-12).

As per claims 6 and 25 wherein the device [node] and the device object [software object] refresh information [status] included in the soft-state variables comprises periodic heartbeats [periodic intervals] sent by each entity of the plurality of devices [nodes] and the plurality of device objects [software objects]; the Humphries et al. reference discloses the host computer 20 transmits, at periodic intervals, a message to every node to determine whether or not that node is connected to the network (see column 9 lines 34-41). Since each hardware device has a unique address, the host computer 20 can monitor the status of every hardware device (see column 11 lines 15-26). The use of the various segments in the address also allows the host computer 20 to check the status of the network and to determine the configuration of the network (see column 11 lines 37-39).

As per claim 9 wherein a plurality of system management daemons to detect failures in the plurality of devices and initiate recovery from the failures; the

Humphries et al. reference discloses by using the domain, node ID, type, and subtype segments, the host computer 20 can poll a node and address a digital card (see column 11 lines 40-42). The host computer 20 will then update its file or it might automatically dial a service center to report the discrepancy depending upon the programming of the host computer 2 if that node does not have a digital card connected to it (see column 11 lines 42-48).

The Humphries et al. reference does not expressly disclose a lookup service to maintain a database.

The Waldo et al. reference discloses for each service, the lookup service contains an address used by a client to access the service (see column 2 lines 27-29). A service refers to a resource, data, or functionality that can be accessed by a user, program, device, or another service and that can be computational, storage related, communication related, or related to providing access to another user (see column 4 lines 40-50). The services of the Djinn appear programmatically as objects of the Java programming environment, which may include other objects, software components written in different programming languages, or hardware devices (see column 4 lines 57-60). The lookup service 212 contains one object for each service within the Djinn, and each object contains various methods that

facilitate access to the corresponding service (see figure 2 and column 4 lines 52-54). The Java space 222 is an object repository used by programs within the exemplary distributed system 100 to store objects (see column 6 lines 10-14). To configure a new service, the administrator locates an attribute that provides an applet for this purpose, and during configuration, the administrator may add new attributes, such as the physical location of the service and a common name for it (see column 7 lines 6-10). The lookup service provides an event mechanism that generates notifications as new services are registered, existing services are deleted, or attributes of a service are modified (see column 7 lines 11-16).

As per claim 2 wherein the at least one look-up service comprises an attribute-based look-up service to maintain a first database of the plurality of devices by the plurality of device attributed and a name-based look-up service to maintain a second database of the plurality of device objects by the plurality of devices; the Waldo et al. reference discloses one skilled in the art will appreciate that the exemplary distributed system 100 may contain many lookup services, discovery servers, and Java spaces (see column 6 lines 19-21).

As per claim 4 wherein the second database maintained by the name-based look-up service [lookup service 212] further includes a plurality of computation

[computational] objects; the Waldo et al. reference discloses a service refers to a resource, data, or functionality that can be accessed by a user, program, device, or another service and that can be computational, storage related, communication related, or related to providing access to another user (see column 4 lines 40-50).

As per claims 7 and 26 wherein the periodic heartbeats [heartbeats] sent by each entity of the plurality of devices [nodes, services, devices] and the plurality of device objects [software objects, objects] refresh the entity, such that failure by the entity to send the periodic heartbeats as required by a refresh rate for the entity results in removal of the entity from the at least one look-up service; the Waldo et al. reference discloses when an update occurs, all registered clients receive a notification of the update, enabling the clients to avoid attempting to access a service that is no longer available and to use a service recently added to the lookup service (see column 4 lines 6-10). The lookup service provides an event mechanism that generates notifications as new services are registered, existing services are deleted, or attributes of a service are modified (see column 7 lines 11-16).

As per claims 10 and 27 wherein the plurality of system management daemons include a power line monitoring daemon to detect problems with the

plurality of devices that are power line devices; the Waldo et al. reference discloses the device 106 may be any of a number of devices (see figure 1 and column 4 lines 64-67). The network 108 may be a local are network; wide area network or the Internet (see column 5 lines 2-3). One skilled in the art will appreciate that the exemplary distributed system 100 may include additional computers or devices (see column 5 lines 5-7).

As per claims 15 and 28 wherein a plurality of instances for each of at least one of the plurality of system management daemons, such that the plurality of instances exchange age information, and each instance uses the age information to determine whether it is a leader instance; the Waldo et al. reference discloses an individual set of attributes may be represented as an instance of a cross in the Java programming language (see column 7 lines 32-35). A service item can contain multiple instances of the same class with different attribute values as well as multiple instances of different classes (see column 7 lines 37-43). The registration is persistent across restarts of the lookup service until the lease expires or is cancelled (see column 9 lines 60-67).

As per claim 16 wherein the at least one look-up service, the soft-state store, and the publication/subscription eventing component reside within a system

infrastructure layer of the architecture; the Waldo et al. reference discloses the memory 202 includes a lookup service 212, a discovery server 214, and a Java runtime system 216 (see figure 2 and column 5 lines 8-16). The secondary storage device 204 includes a Java space 222 (see column 5 lines 18-19).

As per claim 17 further comprising an application layer in which the plurality of device objects reside, the Waldo et al. reference discloses the Java runtime system 216 includes the Java API, allowing programs running on top of the Java runtime system to access various system functions (see column 5 lines 20-28).

As per claim 18 further comprising at least one automation application and a plurality of device daemons corresponding to the plurality of devices residing in the application layer, the Waldo et al. reference discloses the Java virtual machine 220 acts like an abstract computing machine (see column 5 lines 36-41). The Java RMI 218 facilitates remote method invocation by allowing objects executing on one computer or device to invoke methods of an object on another device (see column 5 lines 41-44).

As per claim 21 wherein an architecture for an automation system to control and monitor a plurality of devices; see rejections of claims 1, 16 and 17.

As per claim 23 wherein an architecture for an automation system to control and monitor a plurality of devices; see rejections of claims 1, 2, and 9.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to update the one-to-one mapping of physical nodes to software objects taught by Humphries et al. with a lookup service taught by Waldo et al. since the lookup service contains one object for each service within the Djinn, and each object contains various methods that facilitate access to the corresponding service (see figure 2 and column 4 lines 52-54). A lookup service contains an indication of where network services are located within a distributed system comprised of multiple machines connected in a network. A network service refers to a resource, data, or functionality that is accessible on the network. (See Waldo column 2 lines 20-27.)

One of ordinary skill in the art would have been motivated to implement a distributed home automation system with a dynamic lookup service to provide a notification mechanism that can be used by subscribers to receive notification when the lookup service is updated (see Waldo column 2 lines 57-62).

5. Claims 5 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,621,662 to Humphries et al. in view of USPN 6,185,611 to Waldo et al. as applied to claims 1, 2, 4, 6, 7, 9, 10, 15-18, 21, 23, and 25-28 above, and further in view of USPN 6,269,378 Quirt.

As per claims 5 and 24 wherein the at least one address for each device object comprises a synchronous address for synchronous communication with the device object and an asynchronous address for asynchronous communication with the device object, the Humphries et al. reference in view of the Waldo et al reference do not disclose a synchronous address for synchronous communication with the device object and an asynchronous address for asynchronous communication with the device object.

The Quirt reference discloses the Name Service 110 is integrated in an object oriented software system 100 comprising a plurality of software objects 102 (see figure 1A and column 6 lines 18-21). The Name Service 110 allows a given software object to locate another software object in the system through the use of a persistent name (see column 6 lines 24-26). Lookup requests to the Name Service are made by objects as ordinary synchronous procedure calls. When the

client attempts to send a message to the software object, it does so in an asynchronous fashion. (See Abstract.)

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to implement the synchronous interface in an asynchronous software system taught by Quirt in the distributed architecture taught by both Humphries et al. and Waldo et al.

One of ordinary skill in the art would have been motivated to further modify the distributed systems taught by both Humphries et al. and Waldo et al. to provide an improved method for locating a software object in an asynchronous distributed software system with the simplicity of synchronous interaction (see Quirt column 3 lines 53-57).

6. Claims 3, 8, 11-14, 19, 20, and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to distributed architectures in general:

USPN 6,192,282 to Smith et al.

USPN 6,195,591 to Nixon et al.

USPN 5,812,533 to Cox et al.

USPN 5,796,602 to Wellan et al.

USPN 5,408,619 to Oran

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Crystal J. Barnes whose telephone number is 703.306.5448. The examiner can normally be reached on Monday-Friday alternate Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A. Follansbee can be reached on 703.305.8498. The fax phone numbers for the organization where this application or proceeding is

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assigned are 703.746.7239 for regular communications and 703.746.7238 for

After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.3900.

cjb

February 28, 2003

Wilbert L. Starks, Jr.
Primary Examiner
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